

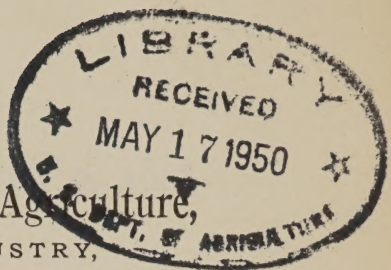
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United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Seed and Plant Introduction and Distribution,

WASHINGTON, D. C.

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## BRIEF CULTURAL DIRECTIONS FOR TOBACCO.

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The following pages are an abstract of Bulletin No. 91 of the Bureau of Plant Industry, which gives cultural directions for the varieties of tobacco the seed of which is distributed by the Department of Agriculture. This abstract has been prepared by Mr. A. D. Shamel, and a copy is inclosed with every packet of seed sent out.

If the grower wishes more information upon the culture of tobacco, he can secure Bulletin No. 91 of the Bureau of Plant Industry by returning the inclosed request card.

LISLE MORRISON,

*Assistant in Charge of Seed Distribution.*

Approved:

B. T. GALLOWAY,

*Chief of Bureau.*

WASHINGTON, D. C., December 19, 1907.

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## DISTRIBUTION OF TOBACCO SEED IN 1908.

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In the following pages very brief directions are given for the culture of the varieties sent out in the Congressional distribution of tobacco seed by the Department of Agriculture. Full and complete directions for culture and for saving seed, with a description of varieties, have been published in Bulletin No. 91 of the Bureau of Plant Industry, which will be sent free of charge to growers testing these varieties of tobacco seed.

A card has been inclosed with every packet of tobacco seed sent out, requesting all growers who desire to cooperate with the Department by sending in a report of their test to sign and return the card. This card is franked and does not require postage. Upon its return to the Department, Bulletin No. 91, containing description of varieties with illustrations and cultural directions, will be forwarded to the sender, together with a blank form on which the report as to the success of the seed sown may be made.

### DIRECTIONS FOR CULTURE.

#### CARE IN SOWING SEED.

The seed which is sent out in the accompanying packets has been carefully tested for vitality and found to be high in germination. All of the seed sent out in the Congressional distribution of tobacco seed has been grown under the most favorable circumstances and conditions for the production of the best types of tobacco. The seed of every variety has been secured from breeders who are located in the sections of the country best adapted by reason of soil, climatic, and other conditions for the production of their particular varieties of tobacco. The seed has been saved under bag, free from cross-fertilization, and treated according to the most improved methods which have been discovered in the course of the experiments of the Bureau of Plant Industry. Nothing has been omitted which would tend to give the grower the best sample of seed of any of the varieties which can possibly be produced.

The importance of every grower of new varieties of tobacco testing on a small scale seed which has not previously been grown in his community and under his conditions of soil and climate can not be too

strongly emphasized. No one can foretell accurately the behavior of any variety when taken from one tobacco-growing section to another. It is necessary, therefore, that tobacco growers use great caution in testing new varieties or varieties the seed of which has not been grown under their conditions. One to 3 acres of plants are sufficient to give any tobacco grower an accurate idea of the comparative value of new seed without danger of great loss from unsatisfactory results. A new variety should not be discarded upon one year's test, but in order to definitely find out its comparative value it must be grown not less than three years under new conditions, and the seed carefully selected every year according to the methods outlined in Bulletin No. 91 of the Bureau of Plant Industry.

In the many reports received from tobacco growers who tested the varieties of seed sent out in 1905-6 and in 1906-7 it was stated that in some cases the seed failed to grow. On tracing such reports it was found in every instance that the necessary care in the preparation of the seed bed, in sowing the seed, and in the care of the young plants had not been taken by the grower. It is therefore of great importance that the grower testing the seed sent out in this distribution follow closely the directions given in this circular and in Bulletin No. 91, of the Bureau of Plant Industry, especially in the care of the seed and seed bed.

#### FLORIDA CUBAN TOBACCO.

Cuban varieties when grown in the United States are used primarily for cigar fillers. In certain areas of Florida, Texas, and Connecticut they are grown to a limited extent under shade for cigar wrappers. Our highest class of cigar filler and wrapper tobaccos is usually produced from Cuban seed.

The location selected for the seed bed should have a slightly southern exposure in order to get the full benefit of the warm rays of the sun in the early spring. The slope should be sufficient to insure perfect drainage at all times in order to protect the young plants from cold winds and to insure a more rapid growth. It is advisable to inclose the bed with boards 10 or 12 inches wide and to stretch tobacco tenting cloth over the entire bed. The location for the seed bed should be permanent, abundantly fertilized every spring, and kept free from weeds and grass at all times.

The soil should be a rich, friable sandy loam. Before sowing the seed the soil should be dug to a depth of 4 or 5 inches and then thoroughly harrowed and stirred with hand rakes until in a finely pulverized condition. All roots, tufts, and clods of earth should be removed. After this preparation a liberal application of fertilizer containing 10 per cent of ammonia, 8 per cent of phosphoric acid, and 12 per cent of soluble potash is recommended for seed-bed pur-



poses. After applying this fertilizer the soil should be thoroughly stirred and left very smooth, in which condition it is ready for the seed.

The seed should be sown at the rate of about 1 tablespoonful to 100 square feet of seed bed. In order to secure an even distribution it should be thoroughly mixed with wood ashes, corn meal, land plaster, or commercial fertilizer. It is advisable to sow half the seed lengthwise of the bed and the remainder crosswise. In this way every portion of the bed will be seeded uniformly. The proper time for sowing the seed is from February 1 to March 1.

Whenever practicable the land should be prepared and the fertilizer applied from one to two weeks before sowing the seed. After sowing a light roller should be run over the bed or some other means taken to get the soil in a firm, compact condition, in which state it will retain its moisture, thus giving favorable conditions for the germination of seed and for the growth of the young plants. The plants should be made to grow steadily and vigorously without being checked until ready for transplanting. In order to obtain this condition strict and constant attention must be given to watering the bed, keeping down weeds and grass, and preventing the ravages of insect pests. In some cases it is necessary to use an additional application of fertilizer in the way of top-dressing. The necessity for this is often indicated by the plants turning yellow. Some system should be provided for watering the plant beds during spells of dry weather. Water should be applied in the form of a light spray. During the first two weeks of plant growth it is essential that the surface soil be kept comparatively moist at all times, for at this stage a few hours of hot sun after the soil has become dry will be sufficient to kill most of the plants.

One of the most injurious insects to be guarded against is the flea-beetle. The injury to the plants by this insect may be prevented by the use of a light spray of Paris green. This mixture should be made at the rate of 1 pound of Paris green to 100 gallons of water, and should be kept constantly stirred when in use. The same remedy is effective in destroying the hornworm, where the seed bed is not covered. The field where the tobacco is to be grown should be plowed and the soil thoroughly pulverized several weeks before the time for transplanting the tobacco.

When grown for wrapper purposes, the following fertilizer has been found very desirable: From 10 to 12 tons of well-rotted stable manure per acre, applied before plowing the land, and after plowing 1,000 pounds of cotton-seed meal, 200 pounds of carbonate of potash, 500 pounds of bone meal, and 500 pounds of lime to the acre. The commercial fertilizer should be worked into the soil by thorough

stirring before the young plants are transplanted. In transplanting the young plants from the seed bed to the field the largest plants with the best shaped leaves and those showing the most vigorous growth should be used. The ordinary distances for Cuban tobacco are 3 feet 2 inches apart for the rows and 12 inches apart in the row.

Before removing the young plants from the bed the soil should be thoroughly watered to avoid injury by breaking the tender roots of the plants. Care should be taken in transplanting the plants in the field to avoid bending or doubling the roots. Unless the transplanting is done during wet weather or immediately after a rain water must be used in order to prevent the plants from dying from the effects of the hot sun and dry soil.

The cultivation of the crop should include the removal of all weeds from the field, particularly during the early stages of growth, and the production of a light, loose mulch on the surface of the soil. It is usually the custom to hoe the young plants twice and to use some form of cultivator once a week during the remainder of the season or until the plants become too large for cultivation. When the plants begin to bud, all except the individual plants saved for seed purposes should be topped. No very definite rule can be given for this process, but it is usually the custom to break off the top of the plant just below the first seed sucker. As a rule the height of the topping must be governed by soil and climatic conditions. It is necessary to remove the suckers before they reach sufficient size to seriously injure or dwarf the plant or interfere in the development of the leaves.

The time for harvesting will depend to a considerable extent upon the season, but the ripeness of the leaves can be distinguished by a thickening and crumpling of the body of the leaves and by the development of light, yellowish patches over the surface.

The manner of harvesting the Cuban tobacco is essentially the same as that practiced in the case of the Connecticut Havana seed. The number of the plants to the lath, however, may be increased to 8 or 10 where the growth is comparatively small. Cuban tobacco is seldom primed, except when grown for wrapper purposes under shade. The care of the crop during curing should be the same as with the Connecticut varieties.

After the cured tobacco has been stripped from the stalk it should be fermented in bulk. This sweating process must be watched with unusual care in order to prevent damage to the crop. It is necessary to turn the bulk several times during the process of fermentation in order to keep the temperature at the desired point. The object of turning the bulk is to reverse its construction, thereby bringing the top, bottom, and outside layers into the middle of the



new bulk. This plan will permit a uniform fermentation of all the tobacco in the bulk. A convenient and practical size of bulk contains from 2,000 to 3,000 pounds. The temperature of the center of the bulk should in no case be allowed to rise above 120° F., and after the temperature falls 8 to 10 degrees the bulk should be turned. The desirable maximum temperature is 115° F. It takes usually from two to four months to complete the process of fermentation. After fermentation the tobacco must be sized, sorted according to different market grades, tied in hands, and packed in the customary packages.

#### FLORIDA SUMATRA TOBACCO.

The variety known as Florida Sumatra tobacco is grown almost entirely for cigar-wrapper purposes, and by far the greater portion is grown under shade.

The preparation of the seed bed should be the same as in the case of the Cuban tobacco, and the field should be prepared and cultivated in practically the same manner. This variety of tobacco, when grown under shade, must be harvested by picking the leaves from the stalk as they ripen, instead of cutting the stalk in the usual manner.

The time for harvesting will depend to a considerable extent upon the season, but the ripeness of the leaves can be distinguished by the development of irregular, light, yellowish-colored patches over the surface, and a thickening and crumpling of the body of the leaves. The leaves should be harvested before they become overripe, and it is the usual practice to pick them at three or four different periods, the lower leaves maturing first, the middle leaves next, and the top leaves last, generally allowing from six to eight days between each picking. After picking the leaves are carried to the curing shed in baskets made for this purpose, and are strung on 4-foot laths especially arranged for them, at the rate of 30 to 40 leaves to the lath. The leaves are arranged back to back and face to face, and are regularly strung on the cord attached to the lath. The laths are then hung in the curing shed, where the leaves are allowed to thoroughly cure out.

When the tobacco is primed from the stalk, it should not take more than three weeks to cure; when it is hung on the stalks, from four to six weeks are necessary. The manipulation of the curing barn is governed entirely by the condition of the weather and the nature of the tobacco, so no fixed rules can be given. However, in a general way, it can be said that the barn should be opened during the day and kept closed during the night. If there are frequent showers and but little sunshine, the barn should be kept closed and small fires started, distributed throughout the building. These fires should be continued as long as it is necessary to thoroughly dry out the entire barn of

tobacco. Where charcoal is not available, wood which has as little odor and as little smoke as possible should be used. It is very important to dry out the barn without giving the tobacco any foreign odors. To obtain the best results the tobacco should become fairly moist and fairly dried out once in every twenty-four hours.

When the midribs are thoroughly cured the leaves are ready to be taken to the packing house. To get the tobacco in condition to handle all the ventilators should be left open for one night, opening them about 6 o'clock in the evening. The next morning the tobacco should be in what is called "good order;" that is, it will have taken up sufficient moisture to make it soft and pliable. The barn is then tightly closed in order to retain the moisture, and the leaves are taken from the laths. The bottom, middle, and top leaves should be kept separate in the barn. After the tobacco has been taken down and packed, it should be hauled at once to the warehouse for fermentation.

The cured tobacco should be fermented in bulk, as in the case of the Cuban variety, but more care is necessary in caring for it after fermentation, to meet the market demands. It must be carefully sorted according to color, texture, and body. After sorting, this tobacco is packed into bales, according to the Sumatra custom.

#### IMPROVED CONNECTICUT HAVANA AND COOLEY HYBRID TOBACCOS.

The improved Connecticut Havana and Cooley Hybrid tobaccos are used for cigar wrappers and cigar binders, and the top leaves are frequently used for blending with other fillers for the cheaper grades of cigars.

The seed bed should be located so as to get all possible benefit from the warm rays of the sun and should be protected from the cold north and northwest winds during the early spring days. It is generally advisable to heat the seed beds in order to get early seedlings, either by making a manure hotbed or by the use of steam or hot water. The common arrangement of the hotbed framework is 8 feet wide and long enough to provide sufficient seedlings for the field. This is covered with glass sash. The beds should be dug out about 2 feet deep a short time before it is necessary to sow the seed, then filled in with fresh horse manure to the depth of about  $1\frac{1}{2}$  feet, and the manure covered with a layer at least 6 inches deep of rich, sandy loam soil. About 200 square feet of seed-bed space should be provided for every acre of tobacco.

The soil in the seed bed should be gotten in the best possible tilth before the seed is sown. It is usually advisable to use a highly nitrogenous fertilizer, one of the most common being cotton-seed meal, thoroughly worked into the soil, or, if necessary, a combination of



commercial fertilizers, such as nitrate of soda, ground bone, and carbonate of potash. From 1 to 2 tablespoonfuls of seed are used to every 200 square feet of seed bed, and one-half of the seed is usually sprouted before sowing. In sprouting the seed, it is mixed with moist apple-tree punk or rotted cocoanut fiber, and allowed to stand in a warm room until the sprouts appear. The sprouted seed is then mixed with the dry seed, and in order to get an even distribution of seed over the surface of the beds it is mixed with land plaster, ashes, or corn meal, and sown during a calm day. The seed should be covered by lightly raking the surface, care being taken not to cover the seed too deep.

The surface of the seed bed must be kept moist all of the time during the first two or three weeks, from the fact that if allowed to become dry all of the tender and delicate young plants will die. The water should be applied in the form of a light spray whenever needed, usually two or three times every day. As the young plants increase in size, the beds must be aired frequently in order to prevent the development of fungous diseases. If flea-beetles or other biting insects attack the plants, the bed should be sprayed with a Paris-green mixture, made up of 1 pound of Paris green to 100 gallons of water. In northern districts the seed of this variety is usually sown between March 15 and April 15.

In preparing the land for a tobacco crop, it is advisable to grow a cover crop, such as vetch or some other legume, which can be turned under in the spring. The best soil is a sandy loam, which should be fertilized by the application of from 10 to 15 tons of barnyard manure per acre. In addition to the barnyard manure, 1,000 pounds of cotton-seed meal, 200 pounds of carbonate of soda, 500 pounds of starter, and a barrel of lime to the acre should be thoroughly worked into the soil with a disk or some other kind of cultivator. In no case should a fertilizer containing chlorin be used for tobacco.

When ready to transplant, the beds should be thoroughly watered before removing the plants, so that they can be pulled without injury to the roots. Care should be taken to discard all irregular and undesirable seedlings and set out only those of uniform size, shape of leaves, and other characters. The Connecticut Havana seedlings should be set in rows 3 feet 3 inches apart and 16 to 18 inches apart in the rows. The plants can be set by hand and watered freely in order to get them started to growing as quickly as possible, but if a transplanting machine is available it will probably give the best results.

The field should be cultivated frequently with a surface cultivator, in order to maintain a loose, fine soil mulch and to remove all of the weeds. It is usually necessary to loosen the soil about the plants one



or more times with a hoe, especially when the plants are small. Cultivation should continue as long as possible, especially during the dry season.

When the seed head begins to develop, the plants are topped; that is, the tops of the plants are broken off in order to promote the development of a broad, thin leaf. The tops are usually removed just below the first seed sucker. Shortly after topping, suckers begin to develop in the axils of the leaves, and should be broken off before they injure or dwarf the plants. The suckering process must be repeated frequently during the season, in order to keep the plants clean. In the experiments of the Bureau of Plant Industry it has been found that by saving the seed from plants free from suckers it is possible to secure types of tobacco bearing but few suckers.

It is difficult to give any directions concerning the proper time to harvest the crop. When the leaves ripen they change in color from a normal dark green to lighter shades, and the leaves increase in thickness and are rough to the touch. Upon bending or folding a ripe leaf it will usually crack or break along the line of the bend. The plants are generally cut off near the ground, just above the worthless sand leaves, with a sharp knife or hatchet. As soon as the plants wilt slightly they are strung on laths, usually from five to six plants to the lath. These laths are fitted with a detachable sharp iron or steel point, which enables the grower to string the plants on the lath. The laths of plants are then taken to the curing shed and hung so that there will be a circulation of air when the sheds are opened. The curing process usually takes from four to six weeks, after which the plants can be taken down, stripped, the different grades sorted out, and the tobacco packed in cases for fermentation. During the curing process, while the plants are green, the sheds are kept closed at night and during wet weather and opened during the day in order to promote the rapid drying out of the leaves and stems. After the plants are practically cured the sheds are kept closed during the day and opened at night and in damp weather.

#### IMPROVED CONNECTICUT BROADLEAF AND BREWER HYBRID TOBACCOS.

The methods of sowing the seed, preparing the seed beds, and handling the young plants of the improved Connecticut Broadleaf and Brewer Hybrid tobaccos, as well as the quantity of seed sown, are practically the same as in the case of Connecticut Havana tobacco. The land is usually fertilized with barnyard manure at the rate of from 8 to 12 tons to the acre and with tobacco stems at the rate of from 500 to 600 pounds to the acre, with little or no commercial fertilizer. Most crops of Broadleaf tobacco are grown by the aid of barnyard manure alone, but in recent years some of the growers have

begun to apply cotton-seed meal, carbonate of potash, and tobacco starter at the same rate as that used for the Havana variety.

On setting out the plants of these varieties, the rows should be arranged 4 feet apart and the plants set from 22 to 24 inches apart in the row. The cultivation of the crop is similar to that for Havana tobacco. There is an unusual abundance of suckers produced on most strains of this variety, and it is necessary to remove the suckers several times during most seasons. The methods of harvesting, curing, and arranging this tobacco for market are similar to those followed for the Connecticut Havana variety.

#### WHITE BURLEY TOBACCO.

The seed bed for the White Burley tobacco should have a slightly southern exposure in order to get the benefit of the warm rays of the sun in the early spring, and the beds should be protected from cold winds. The best soil is a rich, friable virgin loam or sandy soil. The best plan is to burn and prepare the seed bed on old sod lands. Many farmers select a spot in a vegetable garden and cover it with virgin mold taken from the woods and sow it after thoroughly burning the land until it has a reddish or brick-like appearance, when it should be spaded up and thoroughly chopped over with hoes until it is fine and even. The ashes should not be raked off, but should be thoroughly mixed in with the soil. As soon as the ground can be worked in the spring, it should be lightly spaded and thoroughly loosened to a depth of 2 or 3 inches with harrows or hand rakes. When in good condition, it should be marked off in beds about 4 or 5 feet wide and seeded. It is the usual custom in this variety to use a heaping tablespoonful of seed for every 100 square yards of seed bed. After sowing, the best plan is to run a heavy hand roller over the bed or press it with a board or with the feet. As a rule, the bed is tramped over with the feet until the surface is packed. The seed bed is usually protected by a canvas covering to prevent the ravages of the flea-beetle and to keep the bed moist and warm.

The preparation of the land is begun in the winter, generally in March, the usual plan being to turn under the soil with a two-horse plow to a depth of about 8 inches. About the middle of April a revolving disk or harrow is run over the land in order to cut the sod to pieces, after which the field is smoothed over with a slab drag. It is very rare for fertilizers or manure of any kind to be used in the White Burley districts. Tobacco stalks and trash from the barnyard are preferred to any other fertilizer for this tobacco. Owing to the fact that the crop is grown for two years and the field is then put in rotation with other crops, the fertility of the soil is maintained.

The tobacco plants are usually set after a shower or, when there is no rain, they are set out in the afternoon. The land is cultivated with a bull-tongue cultivator during the first week or so, and then cultivated every week with a double-shovel cultivator as long as it is possible to do so without injury to the plants. As soon as the cultivation is finished the plants are topped, leaving from 16 to 20 leaves on each plant. From four to five weeks after topping the tobacco is usually fully ripe, and the plants are cut with a tobacco cutter or butcher knife. The stalks are split down the middle and strung on sticks  $4\frac{1}{3}$  feet in length, after which they are taken to the tobacco barn and hung 12 inches apart on the tier poles. When fully cured the tobacco is sorted, usually into six grades, and the different grades are tied into bundles of from 10 to 20 leaves and packed for the market.

#### ZIMMER SPANISH AND LITTLE DUTCH TOBACCOS.

The preparation and care of the seed bed for the Zimmer Spanish and Little Dutch varieties should be the same as for Connecticut Havana tobacco. The rows of plants in the field should be 3 feet apart and the plants set 15 to 20 inches apart in the row. The plants should be topped so as to leave about 16 leaves for each plant, the average yield being about 600 pounds to the acre for the Zimmer Spanish and 500 pounds to the acre for the Little Dutch. The methods of cultivation, harvesting, and curing are essentially the same as those which are given for the Connecticut Havana tobacco.

#### MARYLAND SMOKING TOBACCO.

The variety known as Maryland Smoking tobacco is used primarily for export purposes, most of it going to France and Germany. A small part of the crop is used in domestic factories for certain pipe and cigarette mixtures.

The seed bed should be located on a dark, friable, loamy soil with a southern exposure. The plants may be easily watered if the seed bed be located near a brook. The old method of burning the seed bed has been largely abandoned, but if used care should be taken to burn only small timber and brush. A large quantity of ashes is detrimental to the growth of the young plants. All trees within 30 or 35 feet of the seed bed should be cut down and piled on the north and west sides for a partial protection against the cold winds. The proper time for preparing and sowing the seed bed is from February 1 to March 30. The bed should be spaded to a depth of 4 or 5 inches and all roots and tufts carefully removed. The soil must be thoroughly pulverized with garden hoes, hand rakes, or other suitable implements.



Before the last stirring an application of a highly nitrogenous fertilizer should be evenly distributed over the bed and thoroughly incorporated into the soil. A mixture of 50 pounds of nitrate of soda, 40 pounds of fine-ground bone, and 10 pounds of carbonate of potash applied at the rate of 30 pounds to the square rod is highly recommended. Sow the seed at the rate of 2 tablespoonfuls to the square rod. It can best be uniformly distributed over the bed by mixing with wood ashes or land plaster, dividing it into two equal parts, and sowing half of it over the bed crosswise and the other half lengthwise.

The sides of the bed should be from 8 to 10 inches high and wires stretched across it 3 feet apart. The beds can be covered with light cheese cloth or tobacco-bed cloth after the seed has been sown. The covering serves as a complete protection against the ravages of the flea-beetle and other insects, provided there are no open spaces around the bed. All weeds and grass should be removed. It is seldom necessary to water the plant beds except in the case of unusually dry weather. Water at this time is very essential. It should be applied as in the northern seed beds, but less frequently, it being seldom necessary to water the beds more than twice a week.

In most cases it is advisable to replenish the plant food with a top-dressing or fertilizer of the same composition as that of the first application. This should be applied in liquid form wherever it is possible to wash it in thoroughly; otherwise it is most important to top-dress the beds only during hot, dry days. The top-dressing should be used when the plants are from 2 to 3 inches high. Where cloth is not used for covering, the beds must be closely guarded against the attacks of the flea-beetle. When this insect first makes its appearance the plants should be treated with Paris green at the rate of 1 pound to 30 pounds of land plaster. The cloth covering should be removed from the beds at least a week before transplanting, to prevent the injurious effect of the radical change from the seed bed to the open field.

Maryland Smoking tobacco is transplanted from May 15 to June 15. Care must be used to wet the seed bed down thoroughly before drawing the plants, thus protecting the roots from injury. The mottled or mosaic tobacco so common in Maryland tobacco fields is frequently due to the practice of drawing the plants when the soil is not thoroughly moistened. This variety should be set in the field in rows  $3\frac{1}{2}$  feet apart and the plants 35 inches apart in the row.

Tobacco should be preceded by a leguminous crop of some kind, hairy vetch being highly recommended for this purpose. In addition to the nitrogen from the leguminous crop, a fertilizer rich in potash and containing a moderate amount of phosphoric acid should

be added before transplanting. The best stand is obtained in the field where the land has been plowed deeply and harrowed several times, thus leaving a thoroughly pulverized soil for the reception of the plants. The methods of cultivation, topping, suckering, and harvesting are essentially the same as in the case of the Connecticut Havana seed.

#### NORTH CAROLINA, TENNESSEE, AND VIRGINIA TOBACCOS.

The North Carolina, Tennessee, and Virginia tobaccos are used in the manufacture of plug, pipe, and cigarette mixtures and to meet the demands of the export trade for heavy shipping tobaccos.

The methods of sowing the seed and preparing and caring for the seed bed are the same for these varieties as those used by the Maryland growers. The seed, however, may be sown at least a month earlier than in Maryland.

Two systems of harvesting are in general use, both of which have certain advantages. One of these systems is to prime the leaves as fast as they ripen and string them on laths, allowing 30 to 32 leaves to a lath. The other system is to cut the entire stalk and cure the leaves on it, as is done with the Havana variety. It is usually flue cured or fire cured, for which purpose a special type of barn is used. The essential points of this barn are that it should be practically air-tight and provided with one or two furnaces having flues leading up through the center of the barn, giving a large heating surface. There should be at least two small ventilators on or near the top of the barn.

As soon as the barn is filled with tobacco, fires should be started and the temperature raised to 90° F., at which point it should remain from twenty-four to thirty hours, during which time the tobacco becomes a uniformly bright yellow. The next step in curing is to raise the temperature from 90° to 120° F. during fifteen to twenty hours. This process is commonly known as "fixing the color." Then the temperature may be raised gradually to 125° F., at which point it should be maintained for about forty-eight hours. By this time the leaves should be almost, if not entirely, yellow, but the stalks will still be green. In order to cure out the stalk the temperature can be raised to 175° F. at the rate of 5 degrees an hour, where it should remain until the stalks are thoroughly dried. Great care must be taken during the entire process of curing not to allow the temperature to fall, for a lowering of the temperature invariably produces discolorations in some parts of the leaf.



## HAZLEWOOD CUBAN.

The Hazlewood Cuban, a cigar-wrapper variety, is adapted for growing under shade, and can safely be tested in the Connecticut Valley, Florida, Georgia, and other shade-growing sections of the United States where it is desirable to grow a cigar-wrapper tobacco from Cuban seed. It is not especially adapted for growing in the open, but would be a desirable variety to test on a small scale for this purpose.

The methods for preparing the seed bed, sowing the seed, and handling the young plants of the Hazlewood Cuban tobacco are practically the same as in the case of Connecticut Havana seed tobacco, and the directions given under the head of Improved Connecticut Havana and Cooley Hybrid tobaccos should be followed for the production of seedlings of this variety.

The cultural methods followed in the case of the Improved Connecticut Havana seed and Cooley Hybrid tobaccos should be used in cultivating the Hazlewood Cuban variety, with the exception that it is to be grown under shade instead of in the open.

## CALKINS SPANISH.

The Calkins Spanish is a Wisconsin variety of tobacco, especially adapted for the production of cigar-binder tobaccos. The directions for preparing the seed bed, sowing the seed, and the culture of the crop are similar to those given for the cultivation of Improved Connecticut Havana seed and Cooley Hybrid tobaccos. This variety is adapted to those sections of the United States producing cigar-binder tobaccos.

## SEED PRODUCTION.

Seed should be saved from the best plants, care being taken to select the types of plant best adapted for the production of the type of tobacco desired. Some of the points to be taken into consideration in making these selections are shape, size, and number of leaves; body, texture, venation, and color of the leaves; time of maturity, height, and habit of growth of the plants; the number and size of suckers, and the quality of the tobacco from the different types of plants.

In order to secure uniform strains of the desirable types of plants cross-fertilization should be prevented by inclosing the seed heads with light paper bags. These bags should be applied before any of the flowers open and should be inspected frequently to forestall any injury to the plants or flowers by the bags.



After the seed pods have turned brown, indicating maturity, the seed heads should be cut off, hung up in a dry place where there is a free circulation of air, and allowed to dry out. When dry the seed should be shelled, the light seed removed with a seed separator, and the heavy seed stored in a safe place having an even temperature.

When a new variety is tried for the first time it is not advisable to grow a large field until the adaptation of this variety to soil and climatic conditions has been ascertained. This policy is of special importance in the case of all imported seed, such as the Cuban, Sumatra, and Turkish varieties.

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